CLAIMS

1. A biaxially oriented polyester film for flexible disks, comprising a polyester containing inert particles, wherein

(A) the smallest value of Young's modulus in the planar direction is 5 GPa or more, and the difference between the largest value and the smallest value of Young's modulus in the planar direction is 1 GPa or less;

(B) the largest value of heat shrinkage factor when the film is heated at 105° C for 30 minutes is 0.6 % or less, and the difference between the largest value and the smallest value of heat shrinkage factor when the film is heated at 105° C for 30 minutes is 0.3 % or less;

(C) the center line average surface roughnesses (Ra) of the both surfaces of the film are in the range of 2 to 10 nm; and

(D) the agglomeration ratio of the inert particles in the film is 30 % or less.

2. The biaxially oriented polyester film according to claim 1, wherein the polyester contains a titanium compound soluble in a polyester, and the content of the titanium compound is 2 to 10 mmol% in terms of elemental titanium (Ti) based on the total of all the recurring units of the polyester.

3. The biaxially oriented polyester film according to claim 2, wherein the polyester contains a phosphorus compound and the titanium compound, and their contents satisfy the following expression (1):

$$0.5 \leqq P/Ti \leqq 10 \qquad (1)$$

wherein P is a value (mmol%) obtained by dividing the number of mols of elemental phosphorus of a phosphonate compound by the total number of mols of all the recurring units of

the polyester, and Ti is a value (mmol%) obtained by dividing the number of mols of elemental titanium of the titanium compound by the total number of mols of all the recurring units of the polyester.

4. The biaxially oriented polyester film according to claim 2, wherein the polyester contains a phosphorus compound and the titanium compound, and their contents satisfy the following expression (2):

$$5 \leqq P + Ti \leqq 100 \qquad (2)$$

wherein P and Ti are as defined hereinabove.

5. The biaxially oriented polyester film according to claim 2, wherein the titanium compound is a polycondensation reaction catalyst for the polyester.

6. The biaxially oriented polyester film according to claim 2, wherein the titanium compound is a tetraalkoxide represented by the following formula (I):

$$Ti(OR^1)(OR^2)(OR^3)(OR^4) \qquad (I)$$

wherein R^1, R^2, R^3 and R^4 are each independently an alkyl group or phenyl group.

7. The biaxially oriented polyester film according to claim 2, wherein the titanium compound is a reaction product of a tetraalkoxide represented by the following formula (I) and an aromatic polycarboxylic acid represented by the following formula (II):

$$Ti(OR^1)(OR^2)(OR^3)(OR^4) \qquad (I)$$

wherein R^1, R^2, R^3 and R^4 are each independently an alkyl group or phenyl group,

$$C_6H_{6-n}(COOH)_n \qquad (II)$$

wherein n is an integer of 2 to 4.

8. The biaxially oriented polyester film according to claim 3, wherein the phosphorus compound is at least one member selected from the group consisting of phosphoric acid, phosphorous acid, phosphonic acid and phosphonate compound.

9. The biaxially oriented polyester film according to claim 1, wherein the inert particles have an average particle diameter of 0.01 to 0.5 μm and are contained in an amount of 0.1 to 0.5 wt% based on the weight of the polyester constituting the film.

10. The biaxially oriented polyester film according to claim 1, wherein the inert particles are spherical silica particles or crosslinked organic particles.

11. The biaxially oriented polyester film according to claim 10, wherein the crosslinked organic particles are at least one member selected from the group consisting of silicone particles and crosslinked polystyrene particles.

12. The biaxially oriented polyester film according to claim 1, wherein the inert particles consist of inert particles (A) having an average particle diameter of 0.01 to 0.5 μm and inert particles (B) having an average particle diameter of 0.1 to 1.0 μm, the content of the inert particles (A) is 0.1 to 0.5 wt% and the content of the inert particles (B) is 0.001 to 0.1 wt% based on the weight of the polyester constituting the film.

13. The biaxially oriented polyester film according to claim 12, wherein the inert particles (A) and the inert particles (B) are each independently selected from the group consisting of spherical silica fine particles and crosslinked organic particles.

14. The biaxially oriented polyester film according to claim 13, wherein the crosslinked organic particles are at least one member selected from the group consisting of silicone particles and crosslinked polystyrene particles.

15. The biaxially oriented polyester film according to claim 1, wherein the polyester is polyethylene terephthalate.

16. The biaxially oriented polyester film according to claim 1, wherein the polyester is polyethylene-2,6-naphthalene dicarboxylate.

17. The biaxially oriented polyester film according to claim 1, wherein the thickness of the film is 20 to 80 μm.

18. The biaxially oriented polyester film according to claim 1, wherein the both surfaces of the film have a center line average surface roughness (Ra) of 2 to 7 nm and scratches having a length of 2 mm or more in each surface of the film are 20 or less per m^2.

19. The biaxially oriented polyester film according to claim 1, wherein the both surfaces of the film have a center line average surface roughness (Ra) of 2 to 7 nm and an incidence of scratches having a length of 0.3 to 1.0 mm in the each surface of film are 10 % or less.

20. A laminated biaxially oriented polyester film for flexible disks, comprising the biaxially oriented polyester film of claim 1 and an adhesive layer which comprises colloidal particles having an average particle diameter of 10 to 200 nm and a water-dispersible polyester resin having a sulfonate group and is formed on both sides of the film.

21. The laminated polyester film according to claim 20, wherein the relationship between the average particle diameter (nm) of the colloidal particles and the thickness (nm) of the adhesive layer satisfies the following expression (4):

$$0.2 \leqq (\text{thickness of adhesive layer/average particle diameter of colloidal particles}) \leqq 3.0 \quad (4).$$

22. A flexible disk comprising the biaxially oriented polyester film of claim 1 and a magnetic layer formed on both sides of the film.

23. A flexible disk comprising the biaxially oriented polyester film of claim 20 and a magnetic layer formed on both sides of the film.

24. The flexible disk according to claim 22 or 23 which has a diameter of 2 to 10 cm.

25. The flexible disk according to any one of claims 22 to 24 which is read by an MR head.